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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/788,953

Filing Date: February 26, 2004

Appellant(s): CHAN ET AL.

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Thomas R. Berthold  
For Appellant

**SUPPLEMENTAL EXAMINER'S ANSWER**

This is in response to the reply brief filed September 22, 2007, which has been received and entered, appealing from the Office action mailed October 12, 2006.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

7031104 B1	Butt et al	4/2006
7072140 B2	Asano et al	7/2006
6882501 B2	Machcha et al	4/2005

### **(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Butt et al (US Pat. No. 7031104 B1) in view of Asano et al (US Pat. No. 7072140 B2).

As recited in claim 1, Butt et al show a data recording disk drive 10 comprising: a housing 22; at least one disk 34 rotatable about an axis of rotation 36; a motor 38 attached to the housing for rotating the disk; a plate (68 or 200, for example) fixed to the housing, the plate extending circumferentially around a sector of the disk and radially across a radially outer annular region of the disk, the plate having a substantially planar surface facing a disk surface, said plate surface having a plurality of discrete surface features arranged in a pattern of radially-spaced concentric rings (see Fig. 5B). Butt et al further show surface feature concentric rings having a variety of sizes and locations (see, e.g., “channels 204 concentrated in *one or more* portions of the inner surface of the base 180” (see col. 8, lines 60-64); “plurality of arcuate channels 158 are located upstream of the actuator arm 50” (see col. 7, lines 32-33); “channels 158 are located downstream of the actuator arm 50” (see col. 7, lines 33-34); “channels 158 are located roughly midway between the upstream side of the actuator arm 50 and the downstream side of the actuator arm 50” (see col. 7, lines 35-37)).

As recited in claim 1, Butt et al do not expressly show each ring comprising a plurality of discrete circumferentially spaced-apart surface features.

Asano et al show a disk drive having airflow adjusting mechanism in which airflow “is smoothly guided and stabilized substantially into a laminar flow” such that “the effect that the vibration or the like caused by the airflow has on the storage disks 16 is suppressed very

effectively" (see col. 6, lines 1-4). Asano et al teach that a continuous ridge 46 (see Fig. 3) is interchangeable with a ridge made of a plurality of discrete surface features 48 spaced apart in a direction of airflow (see Fig. 5; see also col. 6, lines 57-67, especially lines 62-63, "exhibit the above-mentioned function of rectifying the airflow"). Furthermore, by disclosing both types of surface features as alternatives, Asano et al further provide evidence that the substitution of continuous and non-continuous surface features was within the level of ordinary skill in the art.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace each radially-spaced concentric ring of Butt et al with a plurality of discrete surface features spaced-apart in the airflow direction (circumferentially) as taught by Asano et al. The rationale is as follows: When faced with a finite number of predictable, known solutions to the problem of non-laminar airflow, one of ordinary skill in the disk drive art would have had good reason to pursue known options within her or his technical grasp. See KSR v. Teleflex, 82 USPQ2d 1385, 1390 (2007). When faced with a variety of predictable, equivalent solutions to the problem of non-laminar airflow, one of ordinary skill in the disk drive art would have had further reason to substitute known equivalents.

No specific teaching, suggestion, nor motivation to combine is required to establish a *prima facie* case of obviousness. See Ex parte Smith, 83 USPQ 2d 1509, 1517 (BPAI June 25, 2007), citing KSR v. Teleflex, 82 USPQ2d 1385, 1396 (SCt 2007). Rather, a specific teaching, suggestion or motivation (TSM) is merely one possible way of demonstrating obviousness.

As recited in claims 2 and 3, Butt et al show that there is only one disk ("at least one disk", see col. 3, line 6), wherein the housing includes a base 30, the motor 38 and disk 34 being mounted on the base (see Fig. 2).

As recited in claim 2, Butt et al show that the plate (“base 200 having the arcuate channels”, see col. 8, lines 44-45) is part of the base 200 and said plate surface faces the bottom (“lower”, see col. 3, line 67) surface of the disk.

As recited in claim 3, Butt et al show that the plate (“cover 68 having the arcuate channels”, see col. 8, lines 43-44) is part of the cover 68 and said plate surface faces the top (“upper”, see col. 6, line 66) surface of the disk.

Claims 4-5, 10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Butt et al (US Pat. No. 7031104 B1) in view of Asano et al (US Pat. No. 7072140 B2) as applied to claims 1-3 above, and further in view of Machcha et al (US Pat. No. 6882501 B2)

Butt et al show a drive as described above for claims 1-3.

As recited in claim 4, Butt et al show a data recording disk drive 10 comprising: a housing 22; a rotatable stack of disks 34 axially spaced along a common axis of rotation 36; a motor 38 attached to the housing 22 for rotating the disk stack; a plate (68 or 200, for example) fixed to the housing, the plate extending circumferentially around a sector of the two disks and radially across a radially outer annular region of the two disks, the plate having a substantially planar first surface facing a surface of a first disk, said first plate surface having a plurality of discrete surface features arranged in a pattern of radially-spaced concentric rings.

As recited in claim 4, Butt et al are silent regarding each ring comprising a plurality of discrete circumferentially spaced-apart surface features.

See teachings and rationale above for claim 1.

As recited in claim 4, Butt et al are further silent regarding the plate being located between two axially adjacent disks, and a substantially planar second surface facing a surface of

the second disk, said second first plate surface having a plurality of discrete surface features arranged in a pattern of radially-spaced concentric rings.

As recited in claim 4, Machcha et al show a plate 720 having a substantially planar first surface facing a surface of a first disk, and a substantially planar second surface facing a surface of the second disk, said first and second plate surfaces each having surface features (see col. 7, line 19, "textured").

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add a plate with two surfaces between the disks of Butt et al as taught by Machcha et al, and to provide two surfaces of the additional plate with the surface features in the pattern taught by Butt et al. The rationale is as follows: one of ordinary skill in the art would have been motivated to add a plate with two surfaces having the surface features in order to reduce cross-track motion and to decrease drag losses by modifying fluid flow as taught by Machcha (see col. 4, lines 46-57; see also col. 7, lines 18-25), and in order to reduce track mis-registration even more than when only a single featured plate surface is used so as to further improve track pitch and areal density as taught by Butt et al (see col. 8, lines 42-56).

As recited in claim 5, Butt et al are silent regarding a plurality of plates, each plate being located between a different set of two axially adjacent disks.

As recited in claim 5, Machcha et al show a plurality of plates 720, each plate being located between (see Fig. 7A) a different set of two axially adjacent disks 110.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add plural plates to the drive of Butt et al as taught by Machcha et al. The rationale is as follows: one of ordinary skill in the art would have been motivated to add plural plates in

order to modify airflow between a larger number of disks, so as to increase data storage capacity while reducing cross-track motion and drag losses as taught by Machcha et al (see col. 4, lines 46-57; see also col. 7, lines 18-25).

Butt et al are silent regarding whether the surface features have the specifically claimed shapes recited in claims 10 and 12 (dimples and bumps, respectively).

There is no invention in changing the shape of known parts, when the functioning of the apparatus is not changed by the reshaping. *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966). Appellant has provided no evidence of unexpected results due to the claimed shape.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to arrive at the claimed shapes through the process of routine experimentation and optimization in the absence of criticality. The rationale is as follows: one of ordinary skill in the art would have been motivated to achieve a textured surface adapted to modify a fluid flow impinging on an adjacent slider assembly as taught by Machcha et al (see col. 7, lines 18-25).

#### **(10) Response to Argument**

Appellant's arguments filed September 22, 2007 have been fully considered, but they are not persuasive.

On page 2, last paragraph, Appellant argues that Asano et al's "surface features are aligned as *parallel lines* because they are located on the surface of flexible adhesive tape" (emphasis in original). On page 3, 1<sup>st</sup> full paragraph, Appellant further argues that "if the adhesive tape of Asano were to be applied to a surface parallel to the disk surfaces of Butt, the result would be *parallel lines of surface features* extending *perpendicular to a disk radius*. It is not physically possible for the adhesive tape of Asano to be applied to the disk drive of Butt, or

any disk drive, in a manner that would result in “*concentric rings* … comprising a plurality of discrete *circumferentially spaced-apart* surface features”” (emphasis in original).

The Examiner has considered this argument thoroughly and asserts that the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). In this case, Butt et al show continuous concentric rings, and Asano et al teach that a continuous surface feature is interchangeable with, and functions the same way as, a plurality of discrete surface features spaced apart in a direction of airflow. The Examiner recognizes that replacing the continuous concentric rings of Butt et al with a plurality of discrete surface features spaced apart in the direction of circumferential airflow would not be accomplished by bodily incorporating the linear tape depicted in Asano et al. Rather, replacing the continuous concentric rings of Butt et al with a plurality of discrete surface features spaced apart in the direction of airflow is suggested by Asano et al, and the replacement would have been within the level of ordinary skill in the disk drive art at the time of Appellant’s disclosure. Thus, the Examiner has established a *prima facie* case of obviousness, contrary to Appellant’s assertion on page 3, 2<sup>nd</sup> full paragraph.

On page 3, 3<sup>rd</sup> full paragraph, Appellant alleges that “the reason for this incorrect conclusion is the result of an incorrect technical assumption regarding these two substantially different regions of airflow in a disk drive.” Appellant has failed to identify any “incorrect technical assumption”; thus, the argument is not persuasive. Furthermore, there is no invention in

relocating known parts, when the functioning of the apparatus is not changed by the relocation.

In re Japikse, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950). In this case, Appellant has failed to identify what functioning of the apparatus is changed by the relocation of parts. Thus, continuous surface features and discrete surface features are deemed equivalents for controlling airflow in the location of Butt et al, insofar as Asano et al teach that continuous surface features and discrete surface features are equivalents for controlling airflow in the location of Asano et al.

On page 4, 3<sup>rd</sup> paragraph, Appellant argues that "Appellants' invention is not directed to reducing non-laminar air-flow, but rather to reducing viscous shear forces." On page 4, 5<sup>th</sup> paragraph, Appellant further argues (emphasis in original) that "The problem of non-laminar air-flow *above and below the surfaces of rotating disks* is thus best addressed by *planar* surfaces, like those in the prior art damping plates." On page 4, last full paragraph, Appellant argues that "to one skilled in the art of disk drive air-flow, surface features on a planar surface is neither a "known option within her or his technical grasp", nor a "predictable, equivalent solution to the problem of non-laminar airflow", as incorrectly asserted in the Examiner's Answer, in reliance on *KSR v. Teleflex, supra*." On page 5, 1<sup>st</sup> paragraph, Appellant further argues (emphasis in original) that "The problem addressed by Appellants' invention is *not* the reduction of non-laminar air-flow above and below the rotating disks, but the reduction of viscous shear forces caused by *planar* damping plates that already minimize non-laminar air-flow."

The Examiner has considered this argument thoroughly and asserts that the issue is not whether the claimed device is obvious over a planar damping plate; rather, the issue is whether the claimed device would have been obvious over the prior art of record.

Furthermore, concentric ring features on a surface are already taught by Butt et al; thus, the Examiner is not persuaded by Appellant's assertion that "surface features on a planar surface" are unknown, or not within the level of ordinary skill in the art, or not predictable solutions to the problem of non-laminar airflow. Additionally, Asano et al teach that discrete surface features are equivalent to continuous surface features such as those of Butt et al.

Moreover, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See Ex parte Obiaya, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

Finally, in the 3<sup>rd</sup> and 4<sup>th</sup> paragraphs on page 5, Appellant argues (emphasis added by Appellant in the Reply Brief) that:

"The non-obviousness of Appellants' invention should be apparent from the portion of Appellants' specification that refers to Figs. 6A-6B, which show the invention of claims 1 and 4.

"Figs. 6A-6B illustrate a perspective view and cross-sectional view, respectively, of a second embodiment of the damping plate in which the *nonplanar surfaces have discrete surface features* .... While the surface features are shown in Figs. 6A-6B as patterned in concentric rings around the plate, they need not be located in such a pattern. However, *it is believed that this pattern provides concentric rings of substantially planar surfaces between the concentric rings of surface features ... which reduces the turbulent intensity along these rings*". (Appellants" specification, page 7, lines 7-20) (Italics added)

The Examiner has considered this argument thoroughly and agrees with Appellant's admission that Appellant's disclosed apparatus provides concentric rings of substantially planar surfaces between concentric rings of surface features. The Examiner notes that Butt et al show

concentric rings of substantially planar surfaces between continuous concentric rings. The Examiner further notes that replacing the continuous concentric rings of Butt et al with discrete surface features, circumferentially spaced apart in the airflow direction as taught by Asano et al, would preserve said concentric rings of substantially planar surfaces between concentric rings of discrete surface features.

Appellant has disclosed in the specification on page 7, lines 17-20 (emphasis added) that it is the “concentric rings of **substantially planar surfaces between** the concentric rings of surface features, **much like the rings of grooves** and ribs in the embodiment shown in Figs. 4A-4B and Fig. 5, which reduces the turbulent intensity along these rings.” The Examiner has interpreted this as an admission that the spaces between continuous rings, and the spaces between discrete rings, perform the same function in the same way. In view of this admission, Appellant’s arguments attempting to distinguish continuous rings and discrete rings as non-equivalents are disingenuous and non-persuasive.

Appellant’s arguments are thus non-persuasive and the claims under appeal remain rejected.

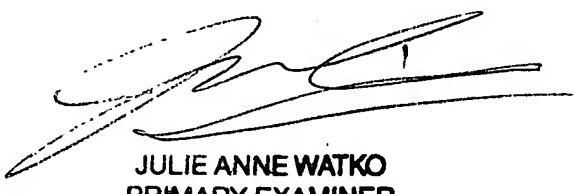
#### **(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner’s answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

JAW



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